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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/004,374	10/19/2001	Stephen J. Sicola	P01-3686	7277

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EXAMINER

BONZO, BRYCE P

ART UNIT	PAPER NUMBER
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2114

DATE MAILED: 08/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/004,374

Applicant(s)

SICOLA ET AL.

Examiner

Bryce P Bonzo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 October 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 October 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

NON-FINAL OFFICIAL ACTION

Status of the Claims

Claims 1-12 are rejected under 35 USC §103.

Claim 1 is objected to on a minor technical matter.

Objections to the Claims

Claim 1 is objected to based the presentation of limitation (c). Upon review of the drawings and specification, the Examiner feels that the limitation (c) should be re-labeled (4) and be double indented to match the intended flow of the algorithm.

Rejections under 35 USC §103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gawne (United States Patent No. 5,710,777).

As per claim 1, Gawne discloses:

In a storage system having a plurality of storage devices communicatively connected by a ring-type communication network, a method of locating a failed device, comprising:

(a) *enabling* network access for all devices on the communication network (column 2, lines 1-10);

(b) iteratively performing the following steps until communication on the ring-type network is restored (column 2, lines 25-26):

(1) *disabling* network access for a subset of devices on the communication network (column 2, lines 22-23),

(2) testing communication on the communication network (column 2, lines 19), and

(3) if communication on the communication network *functions*, then *enabling* network access for the subset of devices (column 2, line 21); and

(c) if communication on the communication network is *fails*, then *disabling* network access for individual devices on the communication network until the addition of a device causes the communication network to *function* (column 2, lines 21-26).

Gawne does not teach the opposite of the functions listed above in italics. Gawne discloses a binary search algorithm which removes devices until only a defective device remains, while Applicant claims binary search algorithm which adds devices until a failure occurs. Official notice is given that is well known in the art to

perform binary searches starting with either a full set or an empty set and adding or removing elements until the desired result is discovered. Further it is well known that both variations are interchangeable, having the same time to completion, results and number of steps on average. Applicant states this at the bottom of page 36 trailing on to the upper portion of page 37. Thus it would have been obvious to one of ordinary skill in the art at the time of invention to perform the binary search of Gawne in a mirror image manner as the binary search performs equally and nearly identically in terms of functionality, resulting in the same answer.

As per claim 2, Gawne discloses:

wherein the step of disabling network access for all devices on the communication network comprises transmitting a disable signal on a communication bus separate from the communication network (column 3, lines 23-26).

As per claim 3, Gawne discloses:

wherein the step of disabling network access for all devices on the communication network comprises closing bypass circuits to disconnect the devices from the communication network (column 3, lines 23-26).

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As per claim 4, Gawne discloses:

wherein the step of enabling network access for a subset of devices in a communication network comprises transmitting an enable signal on a communication bus separate from the communication network (column 2, lines 17-26).

As per claim 5, Gawne discloses:

wherein the step of enabling network access for a subset of devices in a communication network comprises opening bypass circuits to connect the devices to the communication network (column 2, lines 16-26).

As per claim 6, Gawne does not disclose:

wherein on the first iteration the enable signal opens the bypass circuits on all devices assigned an even address.

Gawne does disclose that that roughly half of the addresses need to be selected at one time. In a given network, particularly a storage network as disclosed by Gawne, half of the addresses will be even. Thus it would have been obvious to one of ordinary skill in the art at the time of invention to bypass the even addresses of network, and thus manipulate half of the network. Doing so allows manipulating half of the network without knowing the exact size or location of the network.

As per claim 7, Gawne does not disclose:

wherein on the first iteration the enable signal opens the bypass circuits on all devices assigned an odd address.

Gawne does disclose that that roughly half of the addresses need to be selected at one time. In a given network, particularly a storage network as disclosed by Gawne, half of the addresses will be odd. Thus it would have been obvious to one of ordinary skill in the art at the time of invention to bypass the even addresses of network, and thus manipulate half of the network. Doing so allows manipulating half of the network without knowing the exact size or location of the network.

As per claim 8, Gawne discloses:

A system for locating a failed device in a computer-based information storage system, the storage system including a plurality of storage devices communicatively connected by a ring-type communication network comprising (figure 1):

at least one controller connected to the communication network and connected to an input/output module for regulating access to the communication network by the storage devices (Figure 1, item 8);

a processor executing logic for generating a signal for *enabling* network access for all storage devices on the communication network and for transmitting the signal on a communication bus separate from the communication network (figure 1, item 8);

a processor executing logic for iteratively performing the following steps until communication on the ring-type network is restored (figure 1, item 8):

(1) generating a signal for *disabling* network access for a subset of devices on the communication network (column 3, lines 20-27),

(2) transmitting the signal to the input/output module (column 3, lines 20-27),

(3) testing communication on the communication network (column 3, lines 20-27); and

(4) if communication on the ring-type network functions, then *enabling* network access for the subset of storage devices (column 2, lines 17-27); and

a processor executing logic for *enabling* network access for individual devices on the ring-type network until the *removal* of a storage device causes the ring-type network to *function* (column 2, lines 17-26).

Gawne does not teach the opposite of the functions listed above in italics. Gawne discloses a binary search algorithm which removes devices until only a defective device remains, while Applicant claims binary search algorithm which adds devices until a failure occurs. Official notice is given that is well known in the art to perform binary searches starting with either a full set or an empty set and adding or removing elements until the desired result is discovered. Further it is well known that both variations are interchangeable, having the same time to completion, results and number of steps on average. Applicant states this at the bottom of page 36 trailing on to the upper portion of page 37. Thus it would have been obvious to one of ordinary skill in the art at the time of invention to perform the binary search of Gawne in a mirror

image manner as the binary search performs equally and nearly identically in terms of functionality, resulting in the same answer.

As per claim 9, Gawne discloses:

a cabinet bus provides a communication link to the storage devices separate from the communication network (Gawne discloses a network of communication paths independent of the loop in Figure 1. These paths are considered the "cabinet bus" for purposes of examination).

Gawne does not explicitly disclose:

the devices are arranged in enclosures disposed on shelves of a networking storage cabinet; and

Gawne does disclose the use of his invention under the FDDI protocol which is a ring protocol for use with floppy disk drives, which while not required to be enclosed on shelves are typically mounted in enclosures on shelves. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention arrange the storage devices on shelves in enclosures is standard practice in computer industry, thus providing easy and clear access to the disk drives.

As per claim 10, Gawne does not disclose:

the communication network is a FCAL.

FCAL is a high speed storage protocol which operates as a loop. One of the reasons for its creation was to replace the slower SCSI and FDDI (disclosed by Gawne) loop network protocols. Thus it would have been obvious to one of ordinary skill in the art at the time of invention to modify the FDDI bypass fault isolation system of Gawne to incorporate recent networking advances of FCAL, those allowing for fault isolation in high speed storage networks.

Claim 11 is rejected as being the computer product of the computer method for locating a fault of claim 1, and is rejected on the same grounds shown above.

As per claim 12, Gawne discloses:

In a storage system comprising a plurality of devices residing in a plurality of enclosures and communicatively connected by a ring-type network, a method of locating a failed device, comprising:

sequentially disabling network access for all devices in enclosures on the ring-type network until communication on the ring-type network is restored (column 1, lines 64 through column 2, line 9);

sequentially enabling network access for individual devices on the ring-type network until the addition of a device causes communication on the network to fail (column 1, lines 64 through column 2, lines 9).

Gawne does not explicitly disclose:

carrying this action out on an enclosure-by-enclosure basis. Official Notice is given that was it well known in the art at the time of invention to enclose storage devices in serially linked storage enclosures. Placing storage devices in enclosures provides the benefits of organization, security and safety. Enclosures are most often connected to each other in series. This is because most device level storage networks operate on serial connection such as fiber channel, FDDI or SCSI. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention place the storage devices in enclosures sequentially, thereby conforming to normal safety and organization practices.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bryce P Bonzo whose telephone number is (703) 305-4834. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Beausoliel can be reached on (703) 305-9713. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Bryce P Bonzo
Examiner
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